Amendments to the Specification

Please replace the paragraph beginning on page 1, line 15 with the following:

It is desirable to be able to incorporate any type of data transmission media into a network that includes a satellite. Since each type of media has different characteristics, systems and methods designed to facilitate seamless integration of satellite communication in hybrid systems despite differences in underlying system architectures are highly desirable. ~~Therefor~~ Therefore, a need exists for systems and methods for upgrading the technology of a satellite while the satellite is in orbit.

Please replace the paragraph beginning on page 3, line 20 with the following:

In FIGURE 1, a communications network ~~10~~ 100 comprises a plurality of stations, including at least one spacecraft 12 which provides communication between a plurality of earth stations 14 and 16, by way of a plurality of bi-directional communication links designated 15 and 17 respectively. In one embodiment of the invention, first earth station 14 and second earth station 16 are configured to communicate with each other by means of a terrestrial communication link 19. Terrestrial communication link 19 is selected from the group comprising Public Telephone Switched Network (PTSN) links, the Internet, and wireless communication links. As those of ordinary skill in the art will recognize, alternative embodiments of the invention include additional spacecraft, earth stations and communications links. Spacecraft 12 includes memory 120 in which data, information, program and commands may be temporarily or permanently stored and at least one processor 121 for executing computer programs.

Please replace the paragraph beginning on page 5, line 3 with the following:

Unfortunately, today's spacecraft are not typically configured for operation as nodes of a network. Further, they are not typically configured in accordance with an OSI reference model. Thus, their ability to support hybrid communications networks that rely on a variety of protocols is limited. It would be desirable to configure a spacecraft as a node of a communications network, and for communication with the spacecraft to take place in accordance with an OSI reference model while the spacecraft is in orbit. Further, once a spacecraft is configured to operate in accordance with an OSI reference model, it would be desirable to be able to switch the operation of the spacecraft from one OSI protocol to another while the spacecraft is in orbit.

Please replace the paragraph beginning on page 6, line 21 with the following:

OSI architecture further defines additional layers. These additional layers typically comprise a network layer 316, which defines the complete routing path for data over multiple links, a transport layer 318 which defines at least network congestion control, and an application layer 320 which uses software-defined executable code for performing tasks relating to a particular application. In accordance with an embodiment of the invention, a signal comprises at least one object 210. The object includes at least one method 214, 216 which, when received and executed within the physical layer and link layer on board spacecraft 12, implements at least one additional OSI layer. For example, method 214, 216 implements network layer 316, of the OSI architecture stack illustrated in FIG.2 on board spacecraft 12. In another embodiment of the invention, an object 210 includes at least one method for implementing a transport layer 316 on board spacecraft 12. In yet another embodiment of the invention, object 210 includes at least one method for implementing an application layer on board spacecraft 12.

Please replace the paragraph beginning on page 7, line 5 with the following:

FIGURE 2 includes ~~3 is~~ a representation of an OSI reference model protocol stack 310 as implemented on spacecraft 12 of FIGURE 1 [[2]] in accordance with an embodiment of the ~~invention the~~ invention. ~~In FIGURE 3, t~~ The object 210 of FIGURE 2 arrives at the physical layer 312 of stack 310 and proceeds up the stack. As previously described, the methods of object 210 are executed by processor 121 as it rises through the stack, until it reaches a relevant layer, such as, for example, the network layer. The methods, e.g., 214 and 216 contained within the object 210, are deposited in the relevant layer, where they replace the corresponding previously existing method.

Please replace the paragraph beginning on page 8, line 1 with the following:

In FIGURE [[4]] 3, an object 410 is illustrated as including data 212 and methods 214, 216 as in the case of object 210 of FIGURE 2, and further includes a time stamp designated 412, indicating the time at which the associated data must be received at the designated destination. The data, for example, is audio data transmitted in packets, which must arrive at the destination, preferably in a continuous stream, but at least with each packet arriving no later than the time at which it's information is to be converted into audio, so as not to disrupt the playback. In another example the data is video information with similar constraints. In FIGURE [[4]] 3, the object 410 arrives at the stack 310 of the spacecraft, and is routed to the application layer 320 as in the situation described in FIGURE 2. The methods 214 and 216, are executed in the application layer 320. The methods compare the current time with the time stamp, and cause discard of the object 410 into a "trashcan" 420 if the time stamp is less than (<) or equal to the current time (indicating that the time designated for arrival is already past). If the comparison indicates that the time stamp is greater than (>) the current time, so that the time for its arrival at the destination has not passed, the application layer, under the control of the executable code, passes the information or object 410 to the downlink 17.

Please replace the paragraph beginning on page 8, line 18 with the following:

In another embodiment, the uplinked object is similar to that described above, but the method is one that affects the transport layer of the stack. As in the previously described operations, the object is routed to the application layer 320, and the packet is examined. The application layer recognizes that the method is a new or updated transport method. Consequently, the application layer replaces the transport method currently being used by the transport layer with the newly arrived transport method. When the transport layer controls the rate of packet flow through the network, ~~and~~ it may be considered to be a congestion control process[[es]]. Among the congestion control methods suitable for use in the invention are ~~might~~ the "fast-restart" mechanism, the Reno and Vegas TCP control mechanisms, and the like. In accordance with the invention new control mechanisms are capable of being uplinked and used as appropriate.

Please replace the paragraph beginning on page 9, line 14 with the following:

Other embodiments of the invention will be apparent to those skilled in the art. For example, in the context of a multicast arrangement, the executable code associated with each object or piece of data can identify the destinations to which the spacecraft or ~~spacecraft~~ another node is to transmit the object or its data. The term "multicast" refers to a networking technique that allows data, including data in packet form, to be simultaneously transmitted to a selected set of destinations.

Please replace the paragraph beginning on page 9, line 20 with the following:

Thus, a method according to an aspect of the invention dynamically configures a spacecraft 12 for providing communication between earth stations 14, 16, possibly by way of one or more additional spacecraft. The method is used where the spacecraft 12 includes an open systems interconnect architecture or protocol stack 310 including (a) a physical layer 312 which defines the hardware by which the signals are routed, (b) a link layer 314 which defines the handling of a packet of information within object 210 in the current data link, (c) a network layer 316 which defines the complete routing path for the data over multiple links, (d) a transport layer 318 which defines at least network congestion control, and ~~(f)~~ (e) an application layer 320 which uses, or is at least capable of using, software-defined executable code. The method includes the step of generating data 212, together with at least one method comprising a protocol 214, 216, where the protocol 214, 216 includes executable code implementing at least the data protocol of the data 212. The object 210 comprising the data 212 and the protocol 214, 216 are transmitted to the spacecraft 12 from an earth station 14, 16, and in the alternative, from another spacecraft (not illustrated). The object 210 comprising data 212 and the executable code 214, 216 is received at the spacecraft 12 to thereby generate received signals. At the spacecraft 12, at least the executable code (at least a portion of one of 214 and 216) is extracted from the received signals, and temporarily stored in memory 120. At the spacecraft 12, the code is executed for implementing at least one layer in accordance with an OSI reference model ~~modes~~, for example, at least one of (a) the network layer 316, (b) the transport layer 318, and (c) the application layer 320.